

## New Species of *Triplocania* Roesler from Mexico, Central and South America

(Insecta, Psocoptera, Ptiloneuridae)

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Ten new species of *Triplocania* Roesler, and the male of *T. umbrata* New, are described and illustrated. The new species are from Mexico (one), Belize (three), Brazil (one), Colombia (one), and Peru (four). The male of *T. umbrata* was collected in Peru. *Triplocania* is now known to include 24 species, ranging from Puebla, Mexico (19°56'N, 97°57'W) to Nova Teutonia, Brazil (27°11'S, 52°23'W).

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### Introduction

*Triplocania* Roesler (1940) is one of six genera in the epipsocete family Ptiloneuridae, the closest genera to it being *Perucania*, New & Thornton (1988) and *Euplocania* Enderlein (1910). These three genera are relatively homogeneous in terms of genitalic characters and, as well as the other ptiloneurids, are diagnosed mostly on basis of wing venation differences. Conforming to the diagnosis of the family of Mockford (1993), *Euplocania* presents the fore wing M 4-branched, whereas both *Perucania* and *Triplocania* have the fore wing M 3- branched. The former differs from the latter in having the fore wing pterostigma long, shallow, with almost the same width anteriorly and posteriorly, and with the areola postica very long and shallow. The purpose of this paper is to describe ten new species in the genus, and to describe the male of *T. umbrata* New, that was known from females only. With the above, the number of species is raised to 24, ranging from Puebla, Mexico (19°56'N, 97°57'W) to Nova Teutonia, Brazil (27°11'S, 52°23'W). The presently known species of *Triplocania* (Tab. 1), occur in Mexico, Guatemala, Belize, Costa Rica, Bolivia, Colombia, Peru, and Brazil, this country being the most species rich, with 11 out of 24 species (45.8 %).

The material studied consists of 37 specimens, that belong in the following institutions: Smithsonian Institution, Washington, D.C. (SIC); The Natural History Museum, London (NHM); and the National Insect Collection housed at the Instituto de Biología, UNAM, Mexico City (NIC).

The specimens studied were dissected in 80 % alcohol, and their parts were mounted in Euparal or in Balsam of Canada. The colour was recorded on the specimen in 80 % alcohol, prior to the dissection, under a stereoscopic microscope and illuminated with yellow light. Measurements were taken on parts mounted on slides, under the compound microscope, with a filar micrometer whose measuring unit is 1.36 microns for wings and 0.53 microns for other parts. The following abbreviations stand for lengths of parts measured, or counted: FW = right fore wing, HW = right hind wing, F = right hind femur, T = right hind tibia,  $t_1$ ,  $t_2$ ,  $t_3$  = right hind leg tarsomeres,  $ctt_1$  = No. of ctenidobothria on  $t_1$ ,  $f_1 \dots f_n$  = right antenna flagellomeres 1...n, Mx4 = fourth segment of right maxillary palp, IO = minimum

distance between compound eyes, D = antero-posterior diameter of right compound eye, d = transverse diameter of right compound eye. The measurements are given in microns, and the scales of the illustrations are in mm.

*Triplocania bifida*, spec. nov. (♂)

Figs 1-6

**Types.** Holotype: ♂, Peru, Madre de Dios, Río Tambopata Reserve, 30 km (air) SW Puerto Maldonado, 290 m., 12°50'S, 69°17'W. Smithsonian Institution Canopy Fogging Project. T. L. Erwin et al. 7.III.1984. 02/02/076 (SIC).

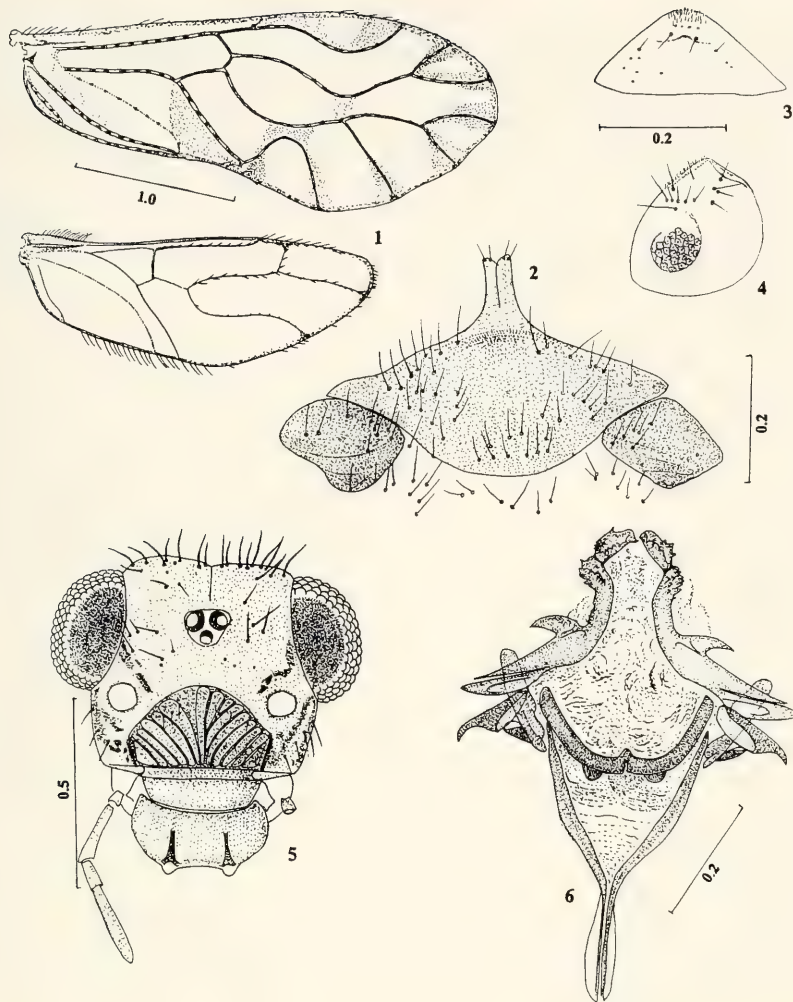
**Description**

**Colour.** Brown. Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Head pattern see Fig. 5. Tibiae with distal ends dark brown. FW mostly hyaline, pterostigma brown, with a clear fenestra in the middle; setae of veins arising from brown areolae; large brown spots on veins, from  $R_{2+3}$  to  $Cu_{1b}$ ; a brown spot between Rs and branching of M and between apex of areola postica and M, and a brown area along  $Cu_1$  and touching  $Cu_2$ ; anterior end of wing pale brown. HW hyaline.

**Morphology.** Fore wings pterostigma long, narrow anteriorly, wide posteriorly as illustrated (Fig. 1): Rs much longer than stem of M, curved, branching posteriorly into short  $R_{2+3}$  and  $R_{4+5}$ .  $M_1$  and  $M_2$  short. Areola postica tall, with round apex (Fig. 1). Hypandrium (Fig. 2), a central, broad sclerite, rounded anteriorly, with a stout, posterior projection deeply cleft in the middle, flanked by large sclerites on antero-lateral ends; setae as illustrated. Phallosome (Fig. 6), with basal arms slender, V-shaped; posteriorly with symmetric, complex sclerites, two small, acuminate ones, two elongate divided anteriorly and posteriorly blunt, and two large, posterior ones, each with an acuminate projection mesally on outer edge, and distally denticulate. Paraprocts broad (Fig. 4), with elongate field of short setae along posterior edge, other setae as illustrated. Sensory fields with 24-26 trichobothria on small basal rosettes. Epiproct (Fig. 3) wide basally, with sides converging towards a rounded apex; a field of short setae next to posterior margin, other setae as illustrated.

**Table 1.** Species of *Triplocania* and their distribution.

1.	<i>T. ariasi</i> New	Brazil (Reserva Ducke)
2.	<i>T. bifida</i> García Aldrete	Peru (Río Tambopata Reserve)
3.	<i>T. brailovskiyana</i> García Aldrete	Mexico (Zacatlán, Puebla)
4.	<i>T. calcarata</i> New	Brazil (Reserva Ducke)
5.	<i>T. caudata</i> New	Brazil (Reserva Ducke)
6.	<i>T. caudatoides</i> García Aldrete	Peru (Río Tambopata Reserve)
7.	<i>T. cervantesi</i> García Aldrete	Belize (Chiquibul Forest Reserve)
8.	<i>T. chiquibulensis</i> García Aldrete	Belize (Chiquibul Forest Reserve)
9.	<i>T. chulumanensis</i> Williner	Bolivia (Yungas)
10.	<i>T. colombiana</i> García Aldrete	Colombia (Curicha)
11.	<i>T. furcata</i> New	Brazil (Matto Grosso)
12.	<i>T. immaculata</i> New	Brazil (Reserva Ducke)
13.	<i>T. lucida</i> Roesler	Brazil (Nova Teutonia)
14.	<i>T. lunulata</i> New	Brazil (Reserva Ducke)
15.	<i>T. magnifica</i> Roesler	Brazil (Nova Teutonia)
16.	<i>T. marginipicta</i> Roesler	Costa Rica (Vara Blanca)
17.	<i>T. obscura</i> García Aldrete	Belize (Chiquibul Forest Reserve)
18.	<i>T. reflexa</i> Roesler	Brazil (Nova Teutonia)
19.	<i>T. robusta</i> García Aldrete	Peru (Río Tambopata Reserve)
20.	<i>T. rondoniensis</i> García Aldrete	Brazil (Rondonia)
21.	<i>T. spinosa</i> Mockford	Mexico (Los Tuxtlas, Veracruz) Guatemala (Tikal)
22.	<i>T. tambopatensis</i> García Aldrete	Peru (Río Tambopata Reserve)
23.	<i>T. umbrata</i> New	Brazil (Reserva Ducke)
24.	<i>T. vazquezae</i> García Aldrete	Peru (Río Tambopata Reserve) Mexico (Los Tuxtlas, Veracruz)



Figs 1-6. *Triplocania bifida*, spec. nov. ♂. 1. Fore and hind wings. 2. Hypandrium. 3. Epiproct. 4. Left paraproct. 5. Front view of head. 6. Phallosome. Figs 3 and 4 to scale of fig. 2.

Measurements. FW: 3074, HW: 2170, F: 815, T: 1271,  $t_1$ : 590,  $t_2$ : 67,  $t_3$  106,  $ctt_1$ : 19,  $Mx_4$ : 205,  $f_1$ : 432,  $f_2$ : 312, IO: 412, D: 320, d: 185, IO/D: 1.28.

**Etymology.** The specific name refers to the posterior projection of the hypandrium, divided in two parts.

**Discussion.** This species presents the same hypandrial plan as *T. robusta*, spec. nov., *T. rondoniensis*, spec. nov., *T. tambopatensis*, spec. nov., *T. lucida* Roesler, 1940 and *T. umbrata* New, 1980, the male of which is here described and with which it also shares the short  $R_{2+3} - R_{4+5}$ , short  $M_1 - M_2$ , and the FW pigmentation pattern.

***Triplocania brailovskyana*, spec. nov.**

Figs 7-15

**Types.** Holotype: ♂, Mexico, Puebla, Zacatlán (Río San Pedro), 18.VIII.1994, beating vegetation, H. Brailovsky & E. Barrera (NIC). – Paratypes: ♀ allotype, 1♂, 2♀♀, same data (NIC).

## Description

Female. Colour. Ground colour creamy white, with dark brown areas in head, thorax and abdomen, as indicated below. Compound eyes black, ocelli hyaline, with large, ochre centripetal crescents. Maxillary palps creamy white. Mx4 with apex brown. Head pattern (Fig. 12). Antennae pale brown, flagellomeres with apex white and a brown band next to it. Tergal lobes of meso- and metathorax brown; brown spots irregularly distributed on pleurae, mesopleurae more pigmented than pro- and metapleurae. Fore wing hyaline, pterostigma with brown band proximally, veins brown, with large pigmented spots on ends of  $R_{2+3}$ ,  $R_{4+5}$ ,  $M_1$ - $M_3$ ,  $Cu_{1a}$ ,  $Ca_{1b}$ , and small spot on end of 1A. Hind wing hyaline, with brown spots on ends of  $R_{2+3}$ ,  $R_{4+5}$ ,  $M_1$  and  $Cu_2$ . Legs creamy white, apices of coxae and tibiae brown, proximal and distal ends of femora brown;  $t_2$  and  $t_3$  brown. Abdomen creamy white, with conspicuous brown bands on sternites 2-5. Genital segments brown.

Morphology. Fore wing pterostigma shallow, elongate, Rs almost straight, areola postica wide based, rounded (Fig. 7). Subgenital plate broad, setose, rounded posteriorly, with thick brown band along lateral and posterior margins (Fig. 14). Ovipositor valvulae (Fig. 10):  $V_1$  short, slender,  $V_{2+3}$  wide based, narrowing distally, distributed as illustrated; with two basal setae and five-six mesal setae distributed as illustrated, distal portion slender, approximately straight, spiculate distally (Fig. 10). 9<sup>th</sup> sternum broad, with a transverse, thick, curved band, as illustrated (Fig. 10). Paraprocts (Fig. 8), wide based, rounded posteriorly; sensory fields with 32-34 densely packed trichobothria on basal rosettes; setae as illustrated. Epiproct (Fig. 9) wide at base, narrowing posteriorly to round apex; setae as illustrated.

Measurements. FW: 6465, HW: 4360, F: 1500, T: 2680,  $t_1$ : 1106,  $t_2$ : 91,  $t_3$ : 182,  $ctt_1$ : 44, Mx4: 378,  $f_1$ : 1151,  $f_2$ : 1192,  $f_3$ : 1022, IO: 607, D: 394, d: 262.

Male. Colour. Same as in female.

Morphology. Hypandrium (Fig. 15), a large, transverse sclerite, with a stout, wide based, distally blunt posterior extension on each side, with large setae as illustrated, and one large setose sclerite on each side. Phallosome (Fig. 13), with slender apodemes and symmetric, large, deeply sclerotized posterior sclerites, the anterior most acuminate on both ends and the posteriormost stout with inner edge serrate. Paraprocts (Fig. 11) elongate, semi elliptic, with dense mesal field of short setae; other setae as illustrated, sensory fields with 26-28 trichobothria on basal rosettes. Epiproct (Fig. 11) wide based, posteriorly rounded, with a field of short setae along posterior margin, two mesal macrosetae and a central anterior field with 8 short setae.

Measurements. FW: 6374, HW: 4178, F: 1506, T: 2738,  $t_1$ : 1122,  $t_2$ : 109,  $t_3$ : 165,  $ctt_1$ : 44, Mx4: 383,  $f_1$ : 1325,  $f_2$ : 1349,  $f_3$ : 1186,  $f_4$ : 926, IO: 583, D: 438, d: 316.

**Etymology.** The specific name is an adjectival genitive, after the last name of Dr. Harry Brailovsky, of the Instituto de Biología, UNAM, hemipterologist to whom the species is dedicated for collecting and donating the specimens for study.

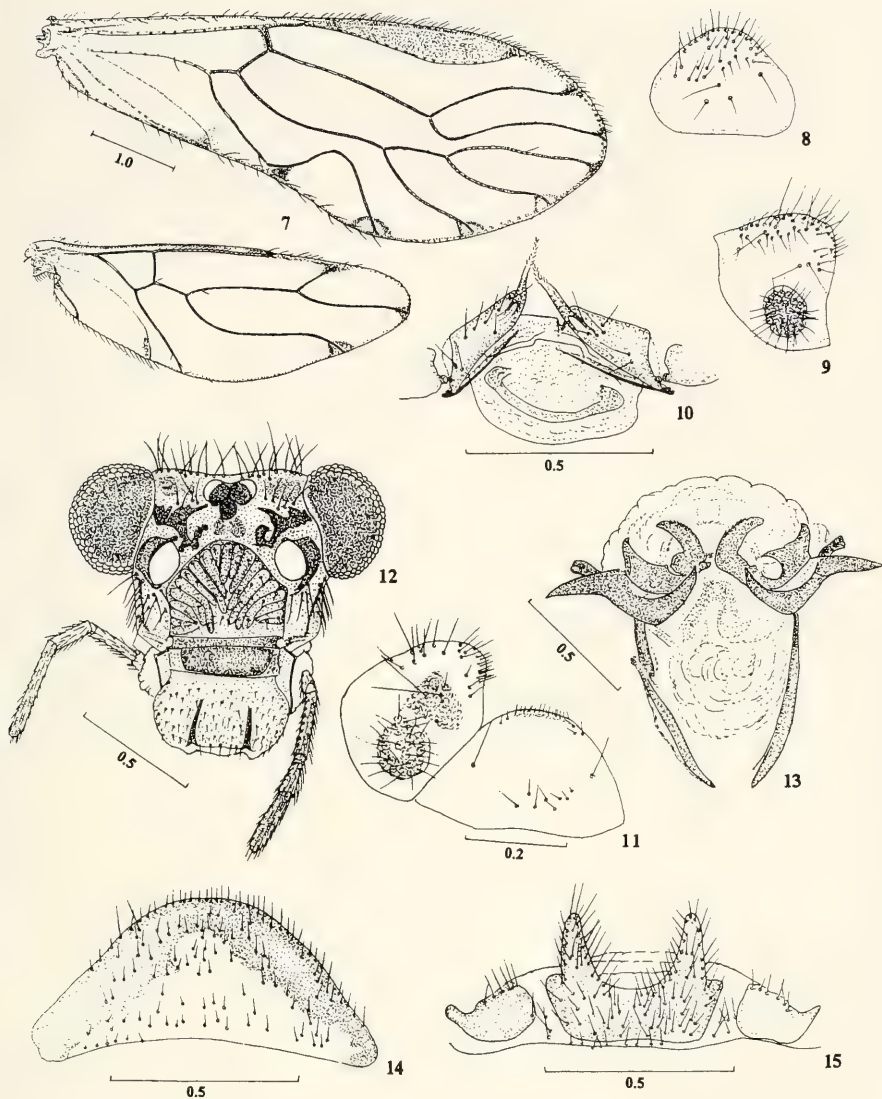
**Discussion.** *T. brailovskyana*, spec. nov. is closest to *T. spinosa* Mockford (1957) and to *T. vazquezae* García Aldrete (1995), both occurring in Mexico. In the three species the hypandrium has stout posterior projections, although in *T. spinosa* the side sclerites to the central piece are not apparent. In the three species the phallosome is structured in the same general plan, with slender apodemes and posterior, symmetric, complex sclerites. In the females, the subgenital plates are simple,  $V_1$  are slender and separate from  $V_2 + V_3$ , and the 9<sup>th</sup> sternum is constituted by a distinct, thick plate. The three species are separable on fore wing pattern, head pattern, and genitalic details of both sexes. *T. brailovskyana* constitutes the third species of the genus to be documented in Mexico.

### *Triplocania caudatoides*, spec. nov. (♂)

Figs 16-20

**Types.** Holotype: ♂, Peru, Madre de Dios, Río Tambopata Reserve, 30 km (air) SW Puerto Maldonado, 290 m, 12°50'S, 69°20'W. Smithsonian Institution Canopy Fogging Project, T. L. Erwin et al. 14.IX.1984, 01/02/062 (SIC).

**Note.** A female, apparently of the same species was taken at the same locality on 4.V.1984 (01/02/054); the specimen is mutilated, lacking the abdomen and most of the legs; it is not described on this account.

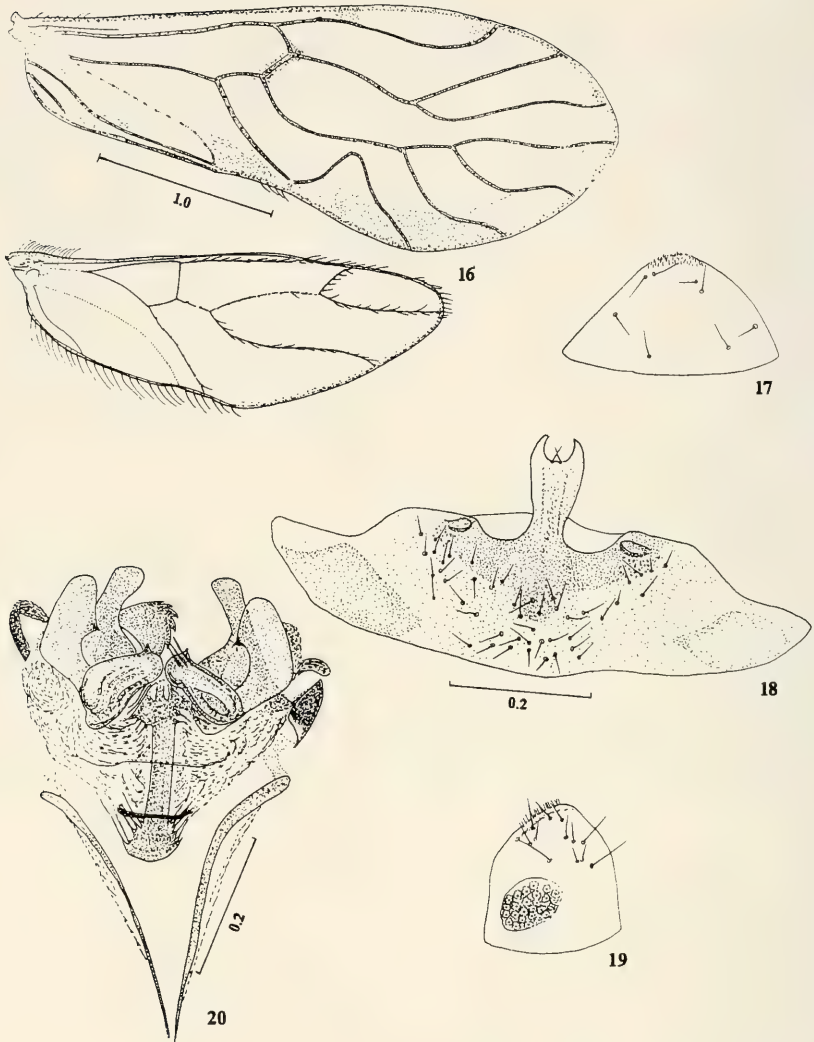


Figs 7-15. *Triplocania brailovskiyana*, spec. nov. ♂. 7. Fore and hind wings, ♀. 8. Epiproct, ♀. 9. Right paraproct, ♀. 10. Ovipositor valvulae and 9<sup>th</sup> sternum, ♀. 11. Right paraproct and epiproct, ♂. 12. Front view of head, ♂. 13. Phallosome, ♂. 14. Subgenital plate, ♀. 15. Hypandrium, ♂. Figs 8 and 9 to scale of fig. 11, fig. 13 to scale of fig. 15.

## Description

**Colour.** Body brown. Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Maxillary palps pale brown; apex of Mx4 dark brown. Antennae pale brown. FW mostly hyaline, veins brown; pterostigma with a brown band proximally and distally; apices of veins with dark brown spots, from  $R_{2+3}$  to  $Cu_{1b}$ . A pale brown band along wing margin from cell  $R_{2+3}$  to  $Cu_2$ , and extending upwards along  $Cu_1$ . Area of wing base between margin and  $Cu_2$  pale brown. HW hyaline (Fig. 16).

**Morphology.** FW pterostigma elongate, narrow anteriorly.  $R_{2+3}$  straight, veins  $R_{4+5}$  to  $M_3$  sinuous; areola postica wide based, tall, with narrow apex and slightly slanted posteriorly (Fig. 16). Hypandri-

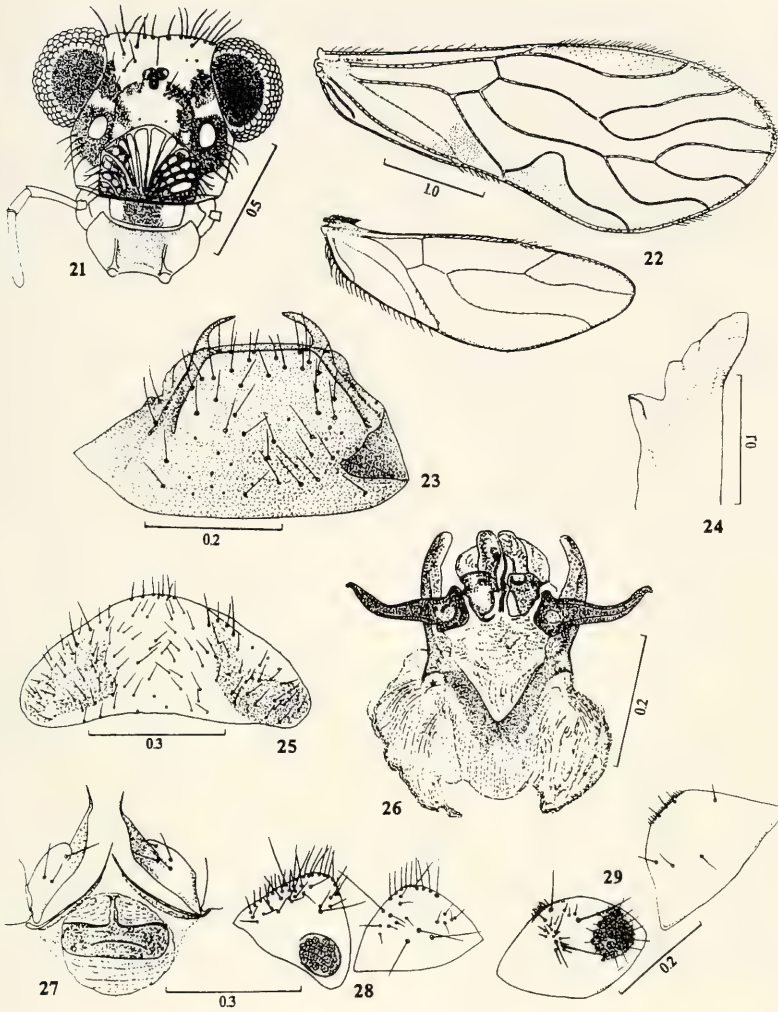


Figs 16-20. *Triplocania caudatoides*, spec. nov. ♂. 16. Fore and hind wings. 17. Epiproct. 18. Hypandrium. 19. Left paraproct. 20. Phallosome. Figs 17 and 19 to scale of fig. 18.

um wide, setae as illustrated (Fig. 18), a central, well defined pigmented area and two elongate, pigmented areas, one on each antero-lateral extreme (Fig. 18). Central area projected posteriorly to form a tongue, deeply concave distally; a small, elongate protuberance on each postero-lateral margin of central area. Phallosome (Fig. 20) V-shaped, endophallic sclerites asymmetric, constituted by a stout longitudinal shaft, with three pairs of stout sclerites posteriorly and a single, broad, dentate sclerite. Paraprocts (Fig. 19) stout, broad, setose, with a field of short setae along inner margin, posteriorly. Epiproct (Fig. 17) wide basally, with sides converging to a rounded apex; setae as illustrated, and a field of short setae transversely, near posterior margin.

Measurements. FW: 3246, HW: 2289, F: 824, T: 1309,  $t_1$ : 558,  $t_2$ : 63,  $t_3$ : 109,  $ctt_1$ : 22, Mx4: 164,  $f_1$ : 833,  $f_2$ : 318, IO: 359, D: 326, d: 211, IO/D: 1.10.

**Etymology.** The specific name *caudatoides* means "similar to *caudata*" and refers to the close relationship of this species to *T. caudata* New.



Figs 21-29. *Triplocania cervantesi*, spec. nov. ♂, ♀. 22. Fore and hind wings, ♀. 23. Hypandrium, ♂. 24. Apex of right lacinia, ♀. 25. Subgenital plate, ♀. 26. Phallosome, ♂. 27. Ovipositor valvulae and 9<sup>th</sup> sternum, ♀. 28. Right paraproct and epiproct, ♀. 29. Right paraproct and epiproct, ♀.

**Discussion.** This species is closest to *T. caudata* New, from the Reserve Ducke, Amazonas, Brazil; the FW pigmentation patterns are identical in both species and the hypandria, paraprocts and epiproct are quite similar; the central tongue is convex in *T. caudata*; the most contrasting differences reside in the phallosome structure, quite distinct in both species (compare Fig. 20 of this paper with Fig. 10 in New 1980).

*Triplocania cervantesi*, spec. nov.  
 Figs 21-29

**Types.** Holotype: ♂, Belize, Cayo District, Chiquibul Forest Reserve, 3-6.IV.1995, Malaise trap 14, A. Howe & T. King (NHM). – Paratypes: ♀ allotype, 1♀, Las Cuevas, 23-26.I.1995, Malaise trap 11, T. King (NHM); further paratypes, all from Chiquibul Forest Reserve, Malaise traps: 1♀, 4-7.III.1996, A. Howe & Rosado (NIC); 1♂, 2♀♀,

1-4.IV.1996, A. Howe T. King (NIC); 1♀, 18-21.IV.1996, A. Howe & T. King (NIC); 1♂, 29.IV.-2.V.1996, A. Howe & Rosado (NIC); 1♀, 16-17.V.1996, A. Howe & Rosado (NIC); 1♀, 27-30.VI.1996, A. Home & T. King (NIC); 1♂, 10-13.VI.1996, A. Howe T. King & Rosado (NIC).

## Description

Female. Colour. Ground colour creamy white, with ochre areas in front coxae, thoracic pleurae, and irregular spotting on abdomen. Head pattern (Fig. 21): Antennae brown, flagellomeres white. Maxillary palps white, Mx4 light brown distally. Compound eyes black, ocelli hyaline, close together, each with ochre centripetal crescent. Legs pale brown, mid coxae medium brown, hind coxae creamy white. Fore wings hyaline, pterostigma with a light brown band proximally and distally; a light brown macula in confluence of  $Cu_2$ -1A, and a light brown band, along wing margin, from areola postica to  $R_{4+5}$ .

Morphology. Lacinial apex with small inner tyne and large, multidenticulate outer lobe (Fig. 24). Fore wing R and M branches distally sinuous. Areola postica very wide based, tall anteriorly and gently sloping posteriorly (Fig. 22). Subgenital plate (Fig. 25) broad, posteriorly rounded, with sides pigmented, setose as illustrated. Ovipositor valvulae (Fig. 27), with  $V_1$  long, slender, about  $\frac{1}{2}$  the length of  $V_{2+3}$ .  $V_{2+3}$  with 3-4 large setae on outer lobe, distal process slightly curved posteriorly, bearing microtriches. 9<sup>th</sup> sternum with broad, almost rectangular, transverse area well defined, with median posterior process (Fig. 27). Paraprocts (Fig. 28), triangular, setose; sensory fields with 21-23 densely packed trichobothria, each issuing from a basal rosette. Epiproct (Fig. 28), wide based, with sides converging to a blunt apex, setae as illustrated.

Measurements. FW: 4610, HW: 3154, F: 1166, T: 1869,  $t_1$ : 831,  $t_2$ : 78,  $t_3$ : 141, ctt<sub>1</sub>: 28, Mx4: 270,  $f_1$ : 763,  $f_2$ : 669,  $f_3$ : 551, IO: 430, D: 396, d: 268, IO/D: 1.08, PO: 0.67.

Male. Colour. Same as in female.

Morphology. Hypandrium (Fig. 23), a broad, setose, almost trapezoidal plate, posteriorly straight, with two slender, curved inward, distally acuminate posterior processes. Phallosome (Fig. 26) broadly V-shaped, with stout external parameres with distal field of pores, a central complex formed by two large, irregular sclerites, associated to two short, stout, posteriorly directed bodies, and, on each side, to a long, wide based, stout, distally acuminate sclerite, perpendicular to external parameres. Paraprocts (Fig. 29), almost elliptical, with field of short setae mesally on outer edge, other setae as illustrated, and sensory fields with 24-26 trichobothria issuing from basal rosettes. Epiproct (Fig. 29), trapezoidal, with field of short setae along posterior border, other setae as illustrated.

Measurements. FW: 3690, HW: 2493, F: 940, T: 1552,  $t_1$ : 704,  $t_2$ : 57,  $t_3$ : 131, ctt<sub>1</sub>: 27, Mx4: 243,  $f_1$ : 678,  $f_2$ : 583,  $f_3$ : 518, IO: 265, D: 421, d: 315, IO/D: 0.63, PO: 0.74.

**Etymology.** The specific name is the genitive after the last name of Dr. Luis Cervates Peredo, of the Natural History Museum, London, to whom the species is dedicated for the donation of specimens of Psocoptera collected in Belize.

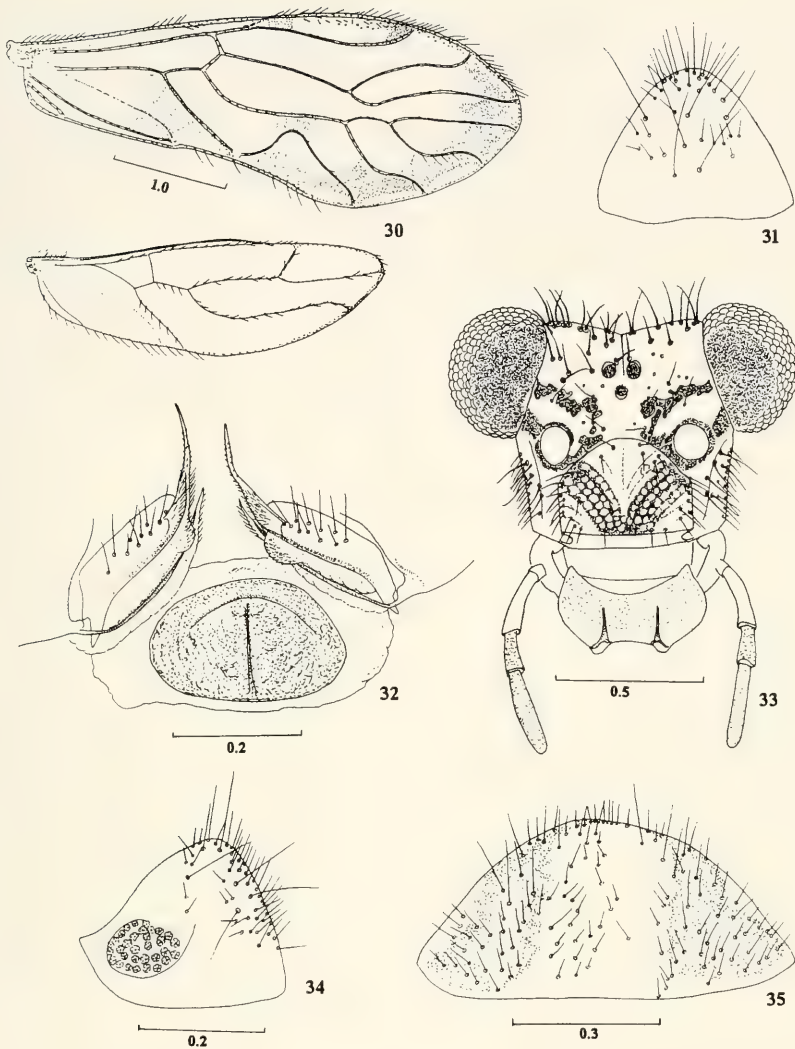
**Discussion.** The subgenital plate, gonapophyses, 9<sup>th</sup> sternum, epiproct and paraprocts of both sexes, and the phallosome of *T. cervantesi* conform closely to the structural plan of the species in the genus. *T. cervantesi* shares with *T. caudata* New, 1980, *T. magnifica* Roesler, 1940, and *T. reflexa* Roesler, 1940, the peculiar shape of the fore wing areola postica and the fore wing marginal pigmented band; other than the shape of the areola postica, the fore wing is also very similar to that of *T. caudatoides*, spec. nov. *T. cervantesi* presents an hypandrium with posterior apophyses, lacking flanking sclerites or pigmented areas, that makes the species unique in the genus, and separable from the known species in it on the basis of these autapomorphies which could eventually segregate it as a genus distinct from *Triplocania*.

### *Triplocania chiquibulensis*, spec. nov. (♀)

Figs 30-35

**Types.** Holotype: ♀, Belize, Cayo District, Chiquibul Forest Reserve, Las Cuevas, 16-19.XI.1994, Malaise Trap 15, T. King (NHM). – Paratypes (all same locality): 1♀, 13-16.IX.1994, Malaise Trap 15, E. Valdés (NHM); 1♀, 4-7.IX.1995, Malaise Trap 11, T. King & A. Howe (NIC); 1♀, San Pastor, 17-20.IV.1995, Flight Interception Trap 14, T. King & A. Howe (NIC); 1♀, 12-15.I.1996, Malaise Trap 11, T. King & A. Howe (NIC); 2♀♀, 18-21.IV.1996, Malaise Traps 11 & 14, A. Howe & T. King (NIC); 1♀, 29.IV.-2.V.1996, A. Howe & Rosado (NIC); 1♀, 27-30.V.1996, Malaise Trap 14, T. King & A. Howe (NIC).





**Figs 30-35.** *Triplocania chiquibulensis*, spec. nov. ♀. 30. Fore and hind wings. 31. Epiproct. 32. Ovipositor valvulae and 9<sup>th</sup> sternum. 33. Front view of head. 34. Left paraproct. 35. Subgenital plate. Fig. 31 to scale of Fig. 34.

### Description

**Colour.** Creamy white, with ochre areas and spots in head (see pattern, Fig. 33), thorax and abdomen. Compound eyes black, ocelli hyaline, with large, ochre centripetal crescents. Mx3 and Mx4 brown, labrum brown; antennae flagellomeres:  $f_1$  pale brown, with an ochre distal band, next to white apex,  $f_2$  and subsequent ones with both ends white, followed by ochre bands, and brown in the middle. Lacinial apices ochre. Legs pale brown, femora with an oblique brown band anteriorly, and a brown oblique band posteriorly, front coxae with an ochre spot on inner face. Tergal lobes of meso- and metathorax ochre, pleurae of same segments with irregular brown spots forming a band, continuing through prothorax and cervix to head. Abdomen with irregular, ochre subcuticular rings, more conspicuous ventrally. Fore wings with irregular brown band along margin, pterostigma with a brown band anteriorly and posteriorly; a brown spot between areola postica and M (pattern, Fig. 30). Hind wing hyaline (Fig. 30).

**Morphology.** Fore wing pterostigma long and slender (Fig. 30).  $R_{2+3}$ ,  $M_2$  and  $M_3$  sinuous; areola postica very wide based, slanted posteriorly. Subgenital plate broad, rounded posteriorly, with setae as illustrated and deeply pigmented along sides and posterior border, as illustrated (Fig. 35). Ovipositor valvulae (Fig. 32):  $V_1$  long, slender,  $V_{2+3}$  heeled at base, with a field of ten setae on outer lobe; distal process, slightly curved, distally spiculate, with a distinct bulge on inner margin. 9<sup>th</sup> sternum (Fig. 32) broad, with a distinct, mesal, almost elliptic area, as illustrated. Paraprocts (Fig. 34) almost triangular, with setae as illustrated and almost circular sensory fields, with 32-33 trichobothria. Epiproct (Fig. 31) almost triangular, with setae as illustrated.

**Measurements.** FW: 4670, HW: 3211, F: 1177, T: 1995,  $t_1$ : 856,  $t_2$ : 101,  $t_3$ : 150,  $ctt_1$ : 29, Mx4: 248,  $f_1$ : 880,  $f_2$ : 785,  $f_3$ : 711, IO: 548, D: 437, d: 299.

**Etymology.** The specific name of this species is an adjective derived from the name of its area of distribution: Chiquibul Forest Reserve.

**Discussion.** The pigmentation pattern of the head, presented by *T. chiquibulensis* is unique in the genus, as unique is the inner bulge on  $V_{2+3}$ . *T. lunulata* New, 1980, also presents marginal lunules on cells  $R_{2+3}$  to areola postica, but the pattern and genital details easily separate both species.

### *Triplocania colombiana*, spec. nov. (♀)

Figs 36-39

**Types.** Holotype: ♀, Colombia, Curicha, 11.IV.1967, B 1034 Malaise Trap, ex. P. Freytag (Leg. C. W. O'Brien) (NIC).

#### **Description**

Colour. Ground colour reddish brown. Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Maxillary palps, antennae and legs brown. Fore wing (Fig. 36) with anterior third pale brown, a pale brown spot between areola postica and  $M$ , apices of veins with a wide brown spot, an irregular brown band along wing margin, from  $R_{2+3}$  to  $Cu_{1+2}$ , leaving wide lunules on each cell, and pterostigma with brown bands anteriorly and posteriorly. Hind wing (Fig. 36), with anterior half pale brown.

**Morphology.** Fore wing pterostigma long, narrow anteriorly, wider in the middle, areola postica wide, slanted posteriorly (Fig. 36). Subgenital plate (Fig. 37) with sides converging to blunt apex, setae as illustrated, with wide pigmented band along sides and posterior border; an irregular, almost elliptic area underlying the plate posteriorly. Ovipositor valvulae (Fig. 38):  $V_1$  long, slender,  $V_{2+3}$  wide based, heeled, with three large setae on outer lobe as illustrated, distal process stout, distally spiculate. 9<sup>th</sup> sternum (Fig. 38) broad, with distinct pigmented area as illustrated. Paraprocts (Fig. 39) broadly triangular, with setal field towards outer and posterior margins and two stout apical macrosetae; sensory fields with 23-25 trichobothria on basal rosettes. Epiproct (Fig. 39) long, triangular, with setae along sides and posterior margin, and three large mesal setae.

**Measurements.** FW: 3545, HW: 2474, F: 951, T: 1568,  $t_1$ : 613,  $t_2$ : 78,  $t_3$ : 132,  $ctt_1$ : 25, Mx4: 231,  $f_1$ : 638,  $f_2$ : 574,  $f_3$ : 511,  $f_4$ : 433, IO: 424, D: 364, d: 255, IO/D: 1.16.

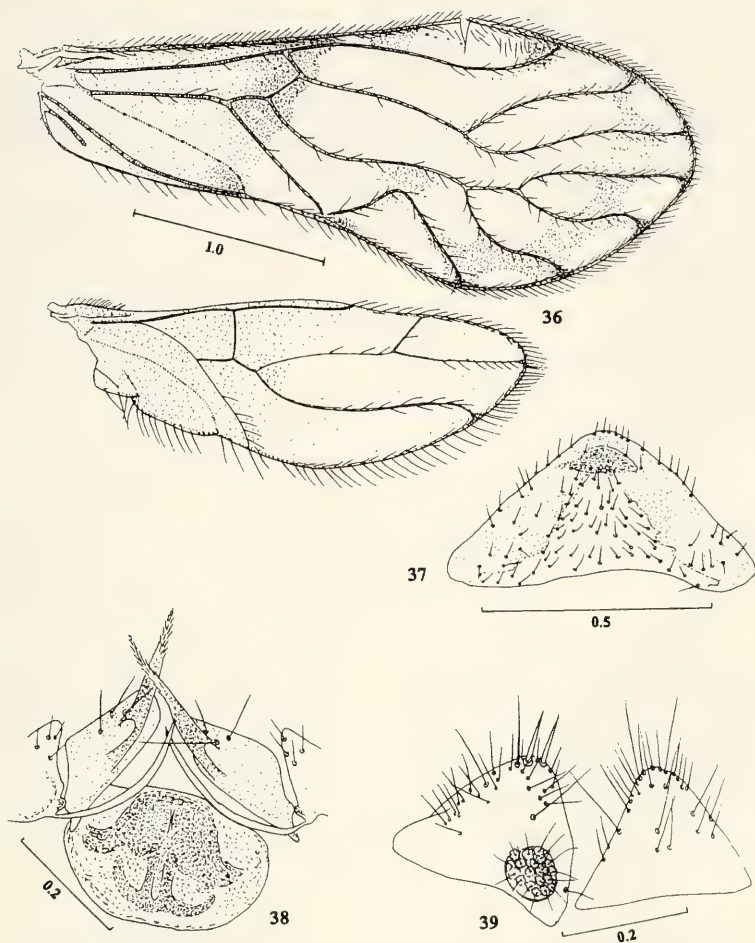
**Etymology.** The specific name makes reference to the country of origin of this species.

**Discussion.** The FW pattern of pigmentation and shape of the areola postica are reminiscent of *T. chiquibulensis*, spec. nov., although the latter lacks the pigmented basal third of the FW, a character shown by *T. lunulata* New, 1980. The stout posterior paraproctal setae represent a character almost unique in the genus, shared only with *T. obscura*, spec. nov. The 9<sup>th</sup> sternum is also distinct from the other known species of *Triplocania*.

### *Triplocania obscura*, spec. nov. (♀)

Figs 40-44

**Types.** Holotype: ♀, Belize, Cayo District, Chiquibul Forest Reserve, 16-19.II.1995, Malaise trap 14, T. King & A. Howe (NHM).

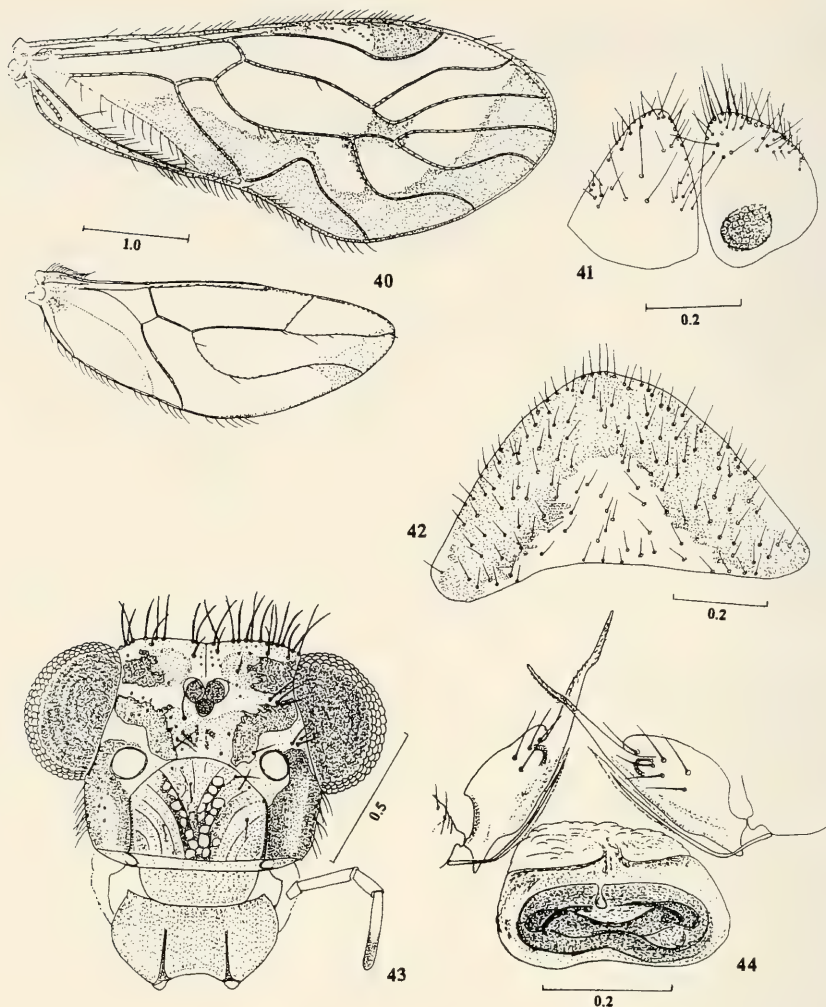


Figs 36-39. *Triplocania colombiana*, spec. nov. ♀. 36. Fore and hind wings. 37. Subgenital plate. 38. Ovipositor valvulae and 9<sup>th</sup> sternum. 39. Right paraproct and epiproct. Fig. 39 to scale of fig. 37.

## Description

**Colour.** Creamy white. Compound eyes black, ocelli hyaline, with ochre centripetal crescents; head pattern (Fig. 43). Labrum and anteclypeus brown, apex of Mx4 brown, antennae pale brown, flagellomeres with brown bands near white proximal and distal apices. Tergal lobes of meso- and metathorax reddish brown; episternum of mesothorax ochre. Coxae, trochanters and femora creamy white, tibiae and t<sub>1</sub> pale brown, t<sub>2</sub> and t<sub>3</sub> reddish brown. Fore wing pattern (Fig. 40), pterostigma basally and distally brown; a wide, brown band along wing margin, from cell R<sub>2+3</sub> to Cu<sub>2</sub>, a brown area between base of R<sub>4+5</sub> and M. HW mostly hyaline, with area limited by Cu<sub>2</sub> brown, and apex brown (Fig. 40).

**Morphology.** Fore wing pterostigma long, basally narrow, wide posteriorly (Fig. 40). R<sub>2+3</sub>-M<sub>3</sub> sinuous. Areola postica very wide basally, slanted posteriorly, apex round, narrow (Fig. 40). Subgenital plate (Fig. 42) broad, setose, rounded posteriorly; pigmented area wide, along sides and posterior margin. Ovipositor valvulae (Fig. 44): V<sub>1</sub> long, slender; V<sub>2+3</sub> stout, extended anteriorly and wider in the middle with 4-6 setae, distributed on outer lobe, as illustrated, distal process long, slender, almost straight, spiculated. 9<sup>th</sup> sternum (Fig. 44) wide, narrow, with a mesal coil as illustrated. Paraprocts (Fig. 41) triangular, with setae as illustrated and sensory fields with 39-41 trichobothria on small basal rosettes. Epiproct (Fig. 41) long, triangular, with setae along sides and posterior margin, and three large mesal setae.



Figs 40-44. *Triplocania obscura*, spec. nov. ♀. 40. Fore and hind wings. 41. Epiproct and left paraproct. 42. Subgenital plate. 44. Ovipositor valvulae and 9<sup>th</sup> sternum. Fig. 42 to scale of fig. 41.

Measurements. FW: 5205, HW: 3509, F: 1256, T: 2109,  $t_1$ : 850,  $t_2$ : 100,  $t_3$ : 135, ctt<sub>1</sub>: 27, Mx4: 291,  $f_1$ : 775,  $f_2$ : 673,  $f_3$ : 636, IO: 571, D: 447, d: 299, IO/D: 1.27.

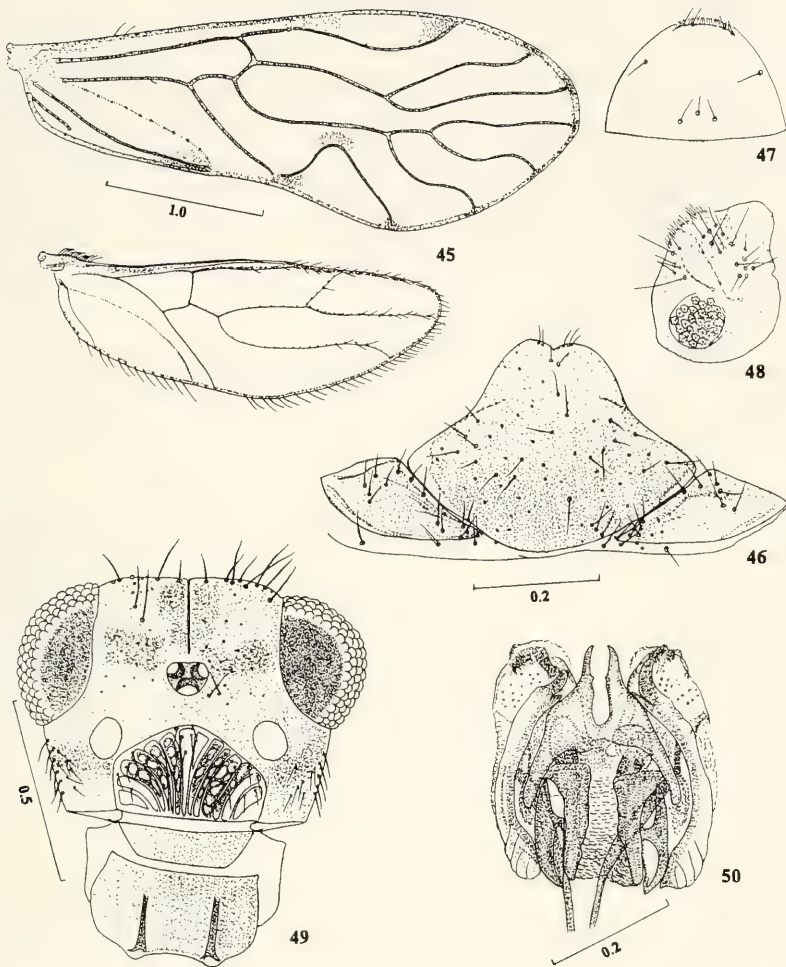
**Etymology.** The specific name "*obscura*" means dark, and refers to the pigmentation pattern of the head and fore and hind wings.

**Discussion.** This species shares with *T. colombiana*, spec. nov. having stout, apical paraproctal macrosetae. The FW and head patterns of pigmentation, and the 9<sup>th</sup> sternum are unique in the genus.

***Triplocania robusta*, spec. nov. (♂)**

Figs 45-50

**Types.** Holotype: ♂, Peru, Madre de Dios, Río Tambopata Reserve, 30 km (air) SW Puerto Maldonado, 290 m, 12°50'S, 69°17'W. Smithsonian Institution Canopy Fogging Project. T. L. Erwin et al. 10.IX.1984, 02/02/61 (SIC).



**Figs 45-50.** *Triplocania robusta*, spec. nov. ♂. 45. Fore and hind wings. 46. Hypandrium. 47. Epiproct. 48. Left paraproct. 49. Front view of head. 50. Phallosome. Figs 47 and 48 to scale of Fig. 46.

### Description

Colour. Pale brown. Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Head pattern (Fig. 49). Tergal lobes of meso- and metathorax dark brown. FW mostly hyaline, veins brown; pterostigma with brown bands proximally and distally, brown spots on apices of veins  $R_{2+3}$  to  $Cu_{1b}$ , a brown area on confluence of  $Cu_2-1A$ , and a brown spot above apex of areola postica. HW hyaline.

Morphology. Pterostigma wider in the middle (Fig. 45), M stem slightly concave proximally, then almost straight,  $M_2-M_3$  sinuous, areola postica tall, slightly slanted posteriorly (Fig. 45). Hypandrium a broad central piece, anteriorly concave, projected posteriorly and distally bilobed, flanked by large, triangular sclerites; setae as illustrated (Fig. 46). Phallosome (Fig. 50) with large, distally rounded, pore bearing external parameres, a central, posterior sclerite, deeply divided, with each arm distally acuminate, flanked by elongate bodies, and proximally with two pairs of sclerites: outer ones acuminate, and inner ones club-shaped, posteriorly denticulate. Paraprocts (Fig. 48) broad, with a field of short setae on inner margin, other large setae as illustrated; sensory fields with 34-36 trichobothria on basal rosettes. Epiproct (Fig. 47) almost semicircular, with an anterior field of three setae, one mesal seta on each side, and four setae towards posterior margin next a transverse field of short setae.

Measurements. FW: 3573, HW: 2506, IO: 413, D: 365, d: 245, IO/D: 1.13.

**Etymology.** The specific name "*robusta*" means stout and refers to the broad central piece of the hypandrium.

**Discussion.** This species belongs in a group in which the males have the hypandrium formed by a large, central sclerite, flanked by smaller ones, one on each antero-lateral side. This group includes *T. bifida*, spec. nov., *T. brailovskiyana*, spec. nov., *T. caudata* New, *T. caudatoides*, spec. nov., *T. immaculata* New, *T. lucida* Roesler, *T. rondoniensis*, spec. nov., *T. spinosa* Mockford, *T. tambopatensis* spec. nov., *T. umbrata* New, and *T. vazquezae* García Aldrete. It differs from all of them in the FW and head pigmentation patterns, and in the structure of the hypandrium and the phallosome. The information on hand does not allow to even guess at the relationships of this species to the others in the group.

### *Triplocania rondoniensis*, spec. nov. (♂)

Figs 51-56

**Types.** Holotype: ♂, Brazil, Rondonia, 62 km SW Ariquemes, Fzda. Rancho Grande, 12.X.1992, C. W. & L. B. O'Brien (NIC). – Paratype: 1♂, same locality, 9.X.1993 (NIC).

#### **Description**

**Colour.** Ground colour brown. Compound eyes black ocelli hyaline, with ochre centripetal crescents. Head pattern (Fig. 53). Maxillary palps and antennae brown. Coxae, trochanters and femora creamy white. Femora with a brown spot distally; tibiae and tarsi brown. FW mostly hyaline, veins brown (Fig. 51). Pterostigma with brown bands anteriorly and posteriorly; apices of veins with dark brown spots. A pale brown band along wing margin from  $R_{2+3}$  to  $Cu_{1b}$ . A pale brown spot between areola postica and  $M_1$  and a brown, triangular area between wing margin and  $Cu_2$ . HW hyaline (Fig. 51).

**Morphology.** Fore wing pterostigma long, narrow anteriorly, wider in the middle, with R, almost at right angle with wing margin,  $R_{4+5} - M_3$  sinuous, areola postica tall, rounded apically, wide based (Fig. 51). Hypandrium a central sickle-shaped piece, with a stout, posterior projection, apically rounded, flanked by large, irregular sclerites; setae as illustrated (Fig. 56). Phallosome (Fig. 52) with basally slender, distally stout external parameres, each with two short pointed apophyses distally on inner edge and symmetrical phallosome sclerites, a large central one, flanked by elongate, distally rounded bodies. Paraprocts (Fig. 55), broad, rounded, with a field of dense, short setae an outer edge, other setae as illustrated; sensory field elongate, with 24-26 trichobothria on basal rosettes. Epiproct (Fig. 54) wide basally, with sides converging to round apex, short field of small setae apically and five setae mesally, as illustrated.

Measurements. FW: 3513, HW: 2482, F: 924, T: 1502,  $t_1$ : 654,  $t_2$ : 65,  $t_3$ : 126,  $ctt_1$ : 22,  $Mx_4$ : 272,  $f_1$ : 565, IO: 390, D: 349, d: 225, IO/D: 1.11.

**Etymology.** The specific name is an adjective derived from Rondonia, and refers to the area of distribution.

**Discussion.** The fore wing pigmentation pattern of this species is similar to that of *T. chiquibulensis*, spec. nov., except that it lacks the clear marginal lunules along the pigmented band. The head pigmentation patterns are also distinct in both species. It seems to stand close to *T. bifida*, spec. nov., *T. caudata* New, and *T. caudatoides*, spec. nov., on having the central sclerite of the hypandrium projected posteriorly.

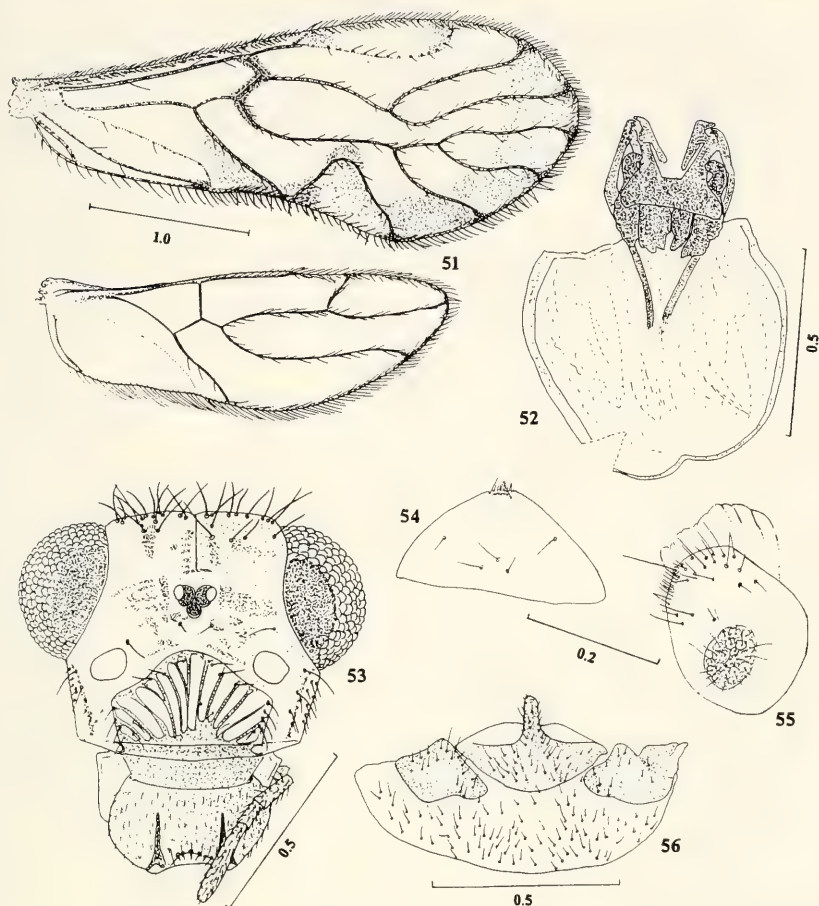
### *Triplocania tambopatensis*, spec. nov. (♂)

Figs 57-62

**Types.** Holotype: ♂, Peru, Madre de Dios, Río Tambopata Reserve, 30 km (air) SW Puerto Maldonado, 290 m, 12°50'S, 69°17'W. Smithsonian Institution Canopy Fogging Project. T. L. Erwin et al. 4.V.1984, 01/02/57 (SIC).

#### **Description**

**Colour.** Reddish brown. Compound eyes black, ocelli hyaline, with ochre centripetal crescents, genae reddish brown, labrum brown, as well as maxillary palps, antennae, and legs. FW pattern (Fig. 57), veins brown, pterostigma with brown, transverse bands proximally and distally; a wide, brown band



**Figs 51-56.** *Triplocania rondoniensis*, spec. nov. ♂. 51. Fore and hind wings. 52. Phallosome. 53. Front view of head. 54. Epiproct. 55. Left paraproct. 56. Hypandrium. Fig. 54 to scale of Fig. 55.

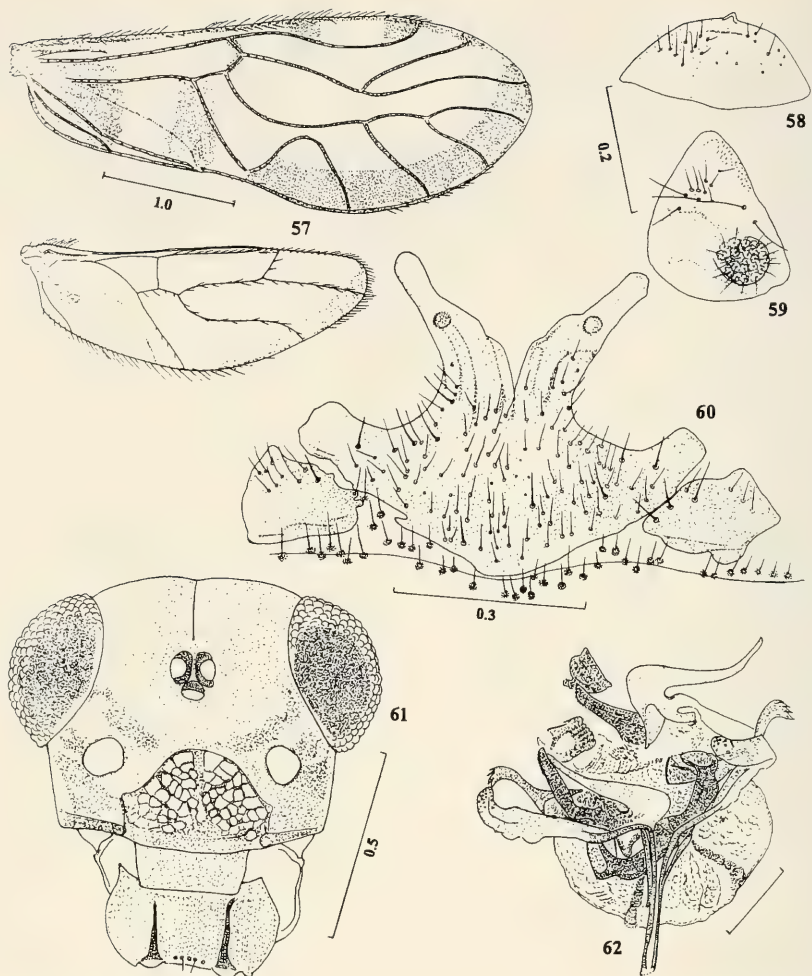
along wing margin, from cell  $R_{2+3}$  to  $Cu_{1b}$ , a transverse, pale brown band on basal half of wing, as illustrated, and a large brown area on proximal end of wing. HW mostly hyaline, with a small, pale brown area proximally, and a pale brown band along wing margin, as illustrated (Fig. 57).

**Morphology.** FW pterostigma elongate, constricted proximally (Fig. 57); M stem concave, areola postica tall, wide based. Hypandrium (Fig. 66), a large central piece flanked by irregular, setose sclerites. Central piece anteriorly rounded, convex, divided posteriorly in two stout, curved, distally blunt arms, each with a rounded protuberance on the inner surface, as illustrated. Phallosome (Fig. 62) with well developed, posteriorly rounded external parameres and four pairs of complex, symmetric sclerites. Paraprocts broad (Fig. 59), with a field of microsetae on inner edge, other setae as illustrated; sensory fields with 24-26 trichobothria on basal rosettes. Epiproct (Fig. 58) wide, with field of setae mesally and a small, posterior, median, conic protuberance.

**Measurements.** FW: 3891, HW: 2604, F: 914, T: 1585,  $t_1$ : 662,  $t_2$ : 59,  $t_3$ : 108, ctt<sub>1</sub>: 22, Mx4: 202,  $f_1$ : 497,  $f_2$ : 357,  $f_3$ : 341,  $f_4$ : 506,  $f_5$ : 360,  $f_6$ : 332, IO: 440, D: 386, d: 242, IO/D: 1.13.

**Etymology.** The specific name is an adjective derived from Tambopata, and refers to the distribution of this species.

**Discussion.** The fore wing pigmentation pattern and venation of this species are reminiscent to those of *T. lumulata* New, although the latter lacks the transverse pigmented band and the former does not have well developed lunules along the marginal pigmented band. The rounded protuberances on the



Figs 57-62. *Triplocania tambopatensis*, spec. nov. ♂. 57. Fore and hind wings. 58. Epiproct. 59. Right paraproct. 60. Hypandrium. 61. Front view of head. 62. Phallosome. Fig. 58 to scale of Fig. 59.

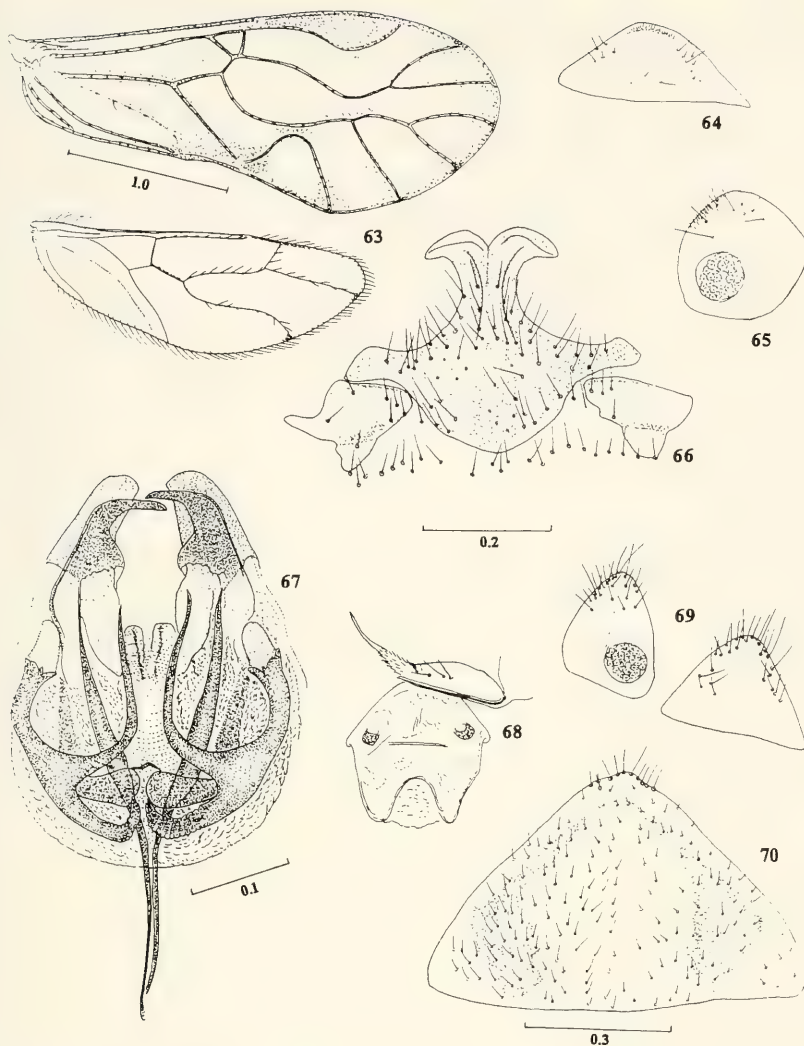
inner side of the hypandrium arms are unique, and the central sclerite of the hypandrium has the same general plan as in *T. lucida* Roesler and *T. reflexa* Roesler. This species is the only known *Triplocania* in which the male epiproct is projected posteriorly, rather than having a transverse marginal field of short setae.

*Triplocania umbrata* New  
Figs 63-70

*Triplocania umbrata* New, 1980, p. 184. Holotype ♀, Reserva Ducke, Amazonas, Brazil (INPA).

This species was described from the Reserva Ducke, Amazonas, Brazil, in 1980, on the basis of two female specimens. One male and one female were collected in the Río Tambopata Reserve, Madre de Dios, Peru, by the Smithsonian Institution Canopy Fogging Project, in 1984. The male is herein described.





Figs 63-70. *Triplocania umbrata* New. 63. Fore and hind wings, ♂. 64. Epiproct, ♂. 65. Left paraproct, ♂. 66. Hypandrium, ♂. 67. Phallosome, ♂. 68. Ovipositor valvulae and 9<sup>th</sup> sternum, ♀. 69. Right paraproct and epiproct, ♀. 70. Subgenital plate, ♀. Figs 64 and 65 to scale of Fig. 66. Figs 68 and 69 to scale of Fig. 70.

### Description of ♂

Colour. Essentially as described for the female.

Morphology. FW (Fig. 63) as described for the female; anomalous, having an additional crossvein from the proximal end of  $R_s$  to  $R_1$ . HW (Fig. 63). Hypandrium (Fig. 66), a large, anteriorly rounded sclerite, projected posteriorly, distally cleft in the middle, flanked by large, irregular sclerites; setae as illustrated. Phallosome (Fig. 67) with basal apodemes long, slender; external parameres stout, blunt ended; endophallic sclerites symmetric, complex (Fig. 67). Paraprocts (Fig. 65) large, rounded, with a long field of short setae on inner margin, other setae as illustrated. Epiproct (Fig. 64) wide based, with sides converging to round apex; with an elongate field of short setae along posterior margin, a field of setae on each side and three setae in the middle.

Measurements. FW: 3079, HW: 2142, F: 774, T: 1248, IO: 388, D: 311, d: 184, IO/D: 1.24.

**Specimens examined:** 1♂, allotype, Peru; Madre de Dios, Río Tambopata Reserve, 30 km (air) SW Puerto Maldonado, 290 m, 12°50'S, 69°20'W. Smithsonian Institution Canopy Fogging Project. T. L. Erwin et al. 14.IX.1984, 01/02/88 (– open parenthesis SIC); 1♀, same locality, 10.IX.1984, 02/02/65 (SIC).

**Discussion.** On the basis of the hypandrium and phallosome structure, this species is close to *T. lucida* Roesler, from which it differs in genital details and FW venation.

### Acknowledgements

To Terry L. Erwin for facilitating the loan of specimens from Tambopata, Peru, taken by the Smithsonian Institution Canopy Fogging Project; to Christopher Lyal and Luis Cervantes Peredo of The Natural History Museum (London) for the donation of the Psocoptera from the Chiquibul Forest Reserve, Belize; to Charles W. O'Brien and Lois B. O'Brien of Florida A & M University (Tallahassee) for the donation of *Triplocania colombiana*. Thanks are also extended to H. Brailovsky and E. Barrera (Instituto de Biología, UNAM), for the specimens of *T. brailovskyana*, and to J. García Figueroa, F. Villegas and S. López of the same institution for logistic support during the preparation of this paper.

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